

**METHOD AND APPARATUS FOR PROVIDING A CURRENT-IN-PLANE (CIP)
GMR SENSOR WITH AN IMPROVED IN-STACK BIAS LAYER WITH A
THINNER SENSOR STACK**

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ABSTRACT

A method and apparatus for providing a current-in-plane (CIP) GMR sensor with an improved in-stack bias layer with a thinner sensor stack is disclosed. Improved pinning of a free-layer in a CIP GMR sensor stack is provided using dual in-stack biasing layers. The sensor stack is made thin because an anti-ferromagnetic layer is not necessary to bias the free-layer.

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